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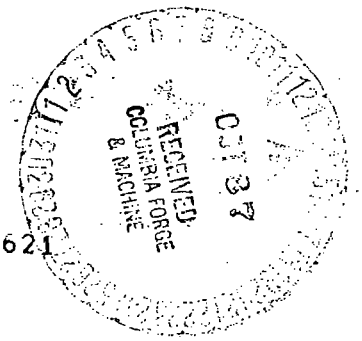
GENERAL TOOL & SUPPLY
407 NW 17TH AVE
PORTLAND OR 97209



COL475 COLUMBIA FORGE & MACHINE WORKS 09/27/87
8424 N CRAWFORD ST 503/286-3621
PORTLAND OR 97203
ATT SAFETY OFFICER

DEAR SAFETY OFFICER:
PLEASE FIND ENCLOSED MATERIAL SAFETY DATA SHEETS COVERING GOODS
RECENTLY PURCHASED. IN MOST CASES YOUR PURCHASE ORDER NUMBER
WILL BE INDICATED TO THE RIGHT OF EACH DATA SHEET DESCRIPTION.

ITEM	MSDS#	DESCRIPTION	PO#
IRO	400	TOOL STEEL TOXIC METALS	3560

Colt Industries

Crucible
Specialty Metals
Division
Box 977
Syracuse, New York 13201

A division of Crucible
Materials Corporation

General Material Safety Data Sheet

1. PRODUCT IDENTIFICATION

Crucible Specialty Metals Division
Crucible Materials Corporation
P.O. Box 977
Syracuse, New York 13201

PRODUCT NAME:
A Supplemental Chemistry Sheet will be issued for each grade shipped to each customer. See Section 2.

DATE OF PREPARATION:
November 1, 1985

TELEPHONE:
(315) 487-4111

PREPARED BY:
Crucible Materials Corporation

REFERENCES:

1. "Encyclopedia of Occupational Health and Safety," Vol. 1 and 2, Third Edition. International Labor Office Publications; Geneva, Switzerland. 1983.
2. "Condensed Chemical Dictionary," Tenth Edition. Gessner G. Hawley, Van Nostrand. Reinhold Company. 1981.
3. "Patty's Industrial Hygiene and Toxicology," Third Edition. George D. and Florence E. Clayton. John Wiley and Sons, New York.
4. "Handbook of Industrial Toxicology," E.R. Pleinkett, M.D.; Industrial Health Services. Chemical Publishing Company, Inc., New York. 1976.
5. "Threshold Limit Values for Chemical Substances and Physical Agents," American Conference of Governmental Industrial Hygienists ISBN: 0-936712-39-4. 1984.
6. "Toxic Metals—Pollution Control and Worker Protection," Marshall Sittig. Noyes Data Corporation; Park Ridge, New Jersey. 1976.
7. "Registry of Toxic Effects of Chemical Substances," compiled by NIOSH-Washington, D.C.; U.S. Government Printing Office.
8. "Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment with Intended Changes: American Conference of Governmental Industrial Hygienists." 1985.
9. "Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Humans," Vol. 32. International Agency for Research on Cancer (IARC); Lyons, France. 1985.
10. "Annual Report on Carcinogens," Third Edition. National Toxicology Program, U.S. Department of Health and Human Services, North Carolina. 1985.

2. HAZARDOUS INGREDIENTS

No threshold limit values (TLV's) exist for specialty steels. TLV may be applicable to constituent elements.

COMPONENT ELEMENTS	CAS NO.	COMPONENT ELEMENTS	CAS NO.
Aluminum (Al)	7429-90-5	Molybdenum (Mo)	7439-98-7
Carbon (C)	7440-44-0	Nickel (Ni)	7440-02-0
Chromium (Cr)	7440-47-3	Selenium (Se)	7782-49-2
Cobalt (Co)	7440-48-4	Silicon (Si)	7440-21-3
Columbium (Cb) Niobium (Nb-syn with Cb)	7440-03-1	Titanium (Ti)	7440-32-6
Copper (Cu)	7440-50-8	Tungsten (W)	7440-33-7
Iron (Fe)	7439-89-6	Vanadium (V)	7440-62-2
Manganese (Mn)	7439-96-5		

2. HAZARDOUS INGREDIENTS (continued)

A Supplemental Chemistry Sheet will be sent covering each grade or type of steel purchased. It will have the maximum level of each element that is present and required to be reported by OSHA Hazard Communication Standard 29 CFR1910.1200.

See Appendix A for the Permissible Exposure Limits as determined by OSHA, ACGIH, and/or IDLH for each component.

3. PHYSICAL DATA

BOILING POINT: 686-5660 C	**MELTING POINT:** 217-3410 C	**SPECIFIC GRAVITY:** 1.8-19.3
VAPOR PRESSURE: N/A	**VAPOR DENSITY:** N/A	**SOLUBILITY IN WATER:** Insoluble except Manganese
EVAPORATION: N/A	**PERCENTAGE VOLATILE BY VOLUME:** N/A	**APPEARANCE AND ODOR:** Solid, odorless metal

See Appendix A, Chemical and Physical Properties, for additional data (if any) for each element.

4. FIRE AND EXPLOSION DATA

FLASH POINT: None	**FIRE POINT:** None

The product is a noncombustible metal.

See Appendix A for any applicable Fire and Explosion Data for each element.

5. HEALTH HAZARD DATA

A. GENERAL COMMENTS

We do not consider this product in the form it is sold to constitute a physical hazard or a health hazard. Subsequent operations such as heating above 1200 F, cutting and/or grinding may cause some of the ingredients to change to a form which could affect exposed workers.

PRIMARY ROUTES OF ENTRY	EMERGENCY FIRST AID
INHALATION:	Remove to fresh air; if condition continues, consult physician.
EYE CONTACT:	Flush well with running water to remove particulate; get medical attention.
SKIN CONTACT:	Brush off excess dirt; wash area well with soap and water.
INGESTION:	Seek medical help if large quantities of material have been ingested (ingestion of significant amounts of metal is unlikely).

5. HEALTH HAZARD DATA (continued)

B. CONSTITUENT HAZARDS

See Appendix A, Permissible Exposure Limits, for the Threshold Limit Values (TLV's) for each constituent.

Effect of Overexposure

Acute:

Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever." Though metals such as Copper and Zinc have been most associated with metal fume fever, it is suspected by some authorities that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to, and easily confused with, flu symptoms), which come on a few hours after exposures. Long term effects of metal fume fever have not been noted.

Chronic:

Excessive and repeated inhalation of Chromium fumes or dust may cause severe irritation, ulceration or cancer in the respiratory system—nose, throat and lungs. It is generally believed that the hexavalent forms of Chromium (Cr+6) are responsible for these effects. Similarly, excessive inhalation of Nickel fumes has been associated with respiratory cancer. Both Chromium and Nickel are sensitizers and may cause allergic reactions. Excessive and prolonged inhalation of Manganese (generally over two years of exposure) can cause damage to the central nervous system—specifically, the pathology resembles Parkinson's Disease. Molybdenum is not foreseen as a hazard in the present context. Though Molybdenum has caused toxicity (anemia and poor growth) in farm animals, there is no documented toxicity to humans due to industrial exposures.

See Appendix A for any additional information for each element.

6. REACTIVITY DATA

STABILITY:
Chemically stable

INCOMPATABILITY:
Reacts with strong acids to generate hydrogen gas

HAZARDOUS DECOMPOSITION PRODUCTS:
Metallic Oxides

POLYMERIZATION:
Will not occur

CONDITIONS TO AVOID:
Avoid generation of airborn dusts and fumes

See Appendix A for additional data (if any) for each element.

7. SPILL, LEAK OR DISPOSAL INFORMATION

STEPS TO BE TAKEN IN CASE OF RELEASE OR SPILL:
N/A

SPECIAL PRECAUTIONS:
Use good housekeeping practices to prevent accumulations of dusts and to keep airborne dust concentrations at a minimum.

WASTE DISPOSAL METHOD:
Dusts, etc.—follow federal, state and local regulations regarding disposal.

See Appendix A, Handling Procedures, for additional data (if any) for each element.

8. SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS:
Use general or local exhaust ventilation to keep airborne concentrations of dust and fumes below TLV. Consult a professional hygienist.

PERSONAL PROTECTION EQUIPMENT:
Always consult a professional hygienist.

RESPIRATORY PROTECTION:
If fumes, misting, or dust conditions occur, consult a professional hygienist. Provide NIOSH approved respirators.

EYE PROTECTION:
Safety glasses should always be worn when grinding or cutting; face shields should be worn when welding or burning.

GLOVES:
Gloves and barrier creams may be necessary to prevent skin sensitization and dermatitis.

OTHER CLOTHING OR EQUIPMENT:
As required.

9. EMERGENCY FIRST AID INFORMATION

If acute overexposure to fumes occurs, remove the victim to fresh air. Then seek medical assistance.

See Section 5, HEALTH HAZARD DATA, Part A, General Comments, for details.

10. ADDITIONAL INFORMATION

For additional information, contact:

Quality Assurance Department
Crucible Specialty Metals Division
Crucible Materials Corporation
P.O. Box 977
Syracuse, New York 13201
Telephone: (315) 487-4111

Colt Industries

Crucible
Specialty Metals
Division
Box 977
Syracuse, New York 13201

A division of Crucible
Materials Corporation

Supplemental Chemistry Sheet

A supplement to the Crucible General Material Safety Data Sheet

NOVEMBER 18, 1985

PLANT MGR. / SAFETY DIR.
GENERAL TOOL & SUPPLY CO
407 N W 17TH AVE
PORTLAND OREGON 97209

ACCT. NO.
287875-01

This Supplemental Chemistry Sheet lists the ingredients for the grade or type of steel you have received from Crucible.

Refer to the General Material Safety Data Sheet sent to your location after November 18, 1985. It will have details of the component elements in our steels, the potential hazards that might arise in processing the material, protection and first aid information, and other relevent data. Together, the General Material Safety Data Sheet and the Supplemental Chemistry Sheet make up the complete Material Safety Data Sheet.

This SCS will have the maximum level of each alloying element that is present and the maximum level of Nickel and Chromium if present as a residual over 0.1%. Levels of 0.1%, 0.5%, and whole percentages will be used for both alloying and residual elements. For example, if the level of Carbon is 1.20%, the SCS will state Carbon <2.0; if Nickel is at a level of 0.15%, the SCS will state Nickel <0.5. Actual chemistry is available upon request by contacting your local Crucible sales district.

This SCS will apply to any subsequent shipment for the same grade or type of material. You will be advised of any major chemistry changes when a subsequent shipment is made.

Questions should be directed to the Quality Assurance Department for Crucible Speciality Metals. Telephone: (315) 487-4111.

Crucible Specialty Metals

GRADE NAME	AISI NAME
REX AAA	T4

C	MN	SI	NI	CR	V	W	MO	CO	FE
<1.0	<1.0	<1.0	<1.0	<5.0	<2.0	<19.0	<1.0	<6.0	BAL